Notice of Allowability	Application No.	Applicant(s)	
	10/549,575	MATSUDA ET AL.	
	Examiner	Art Unit	
	Aline D. McNaull	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *9/19/2005*.

2. ☒ The allowed claim(s) is/are *1-3*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 8/21/2006.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 9/19/05, 3/28/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *8/21/2006* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Status of Claims

- Claims 1-3 are pending in this application.

Response to Amendment

The amendments made to the claims and specification in the preliminary amendment filed 9/19/2005 are acknowledged.

Drawings

The drawings filed on 9/19/2005 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Allowable Subject Matter

Claims 1-3 are allowed.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William Westerman, telephone number 202-822-1100 on 8/16/2006.

The application has been amended as follows:

The abstract filed should be replaced with the following:

--A linear opto-frequency chirp amount variable apparatus using a dielectric multilayer film mirror, which does not require the optical axis to be realigned each time the amount of a chirp is to be varied includes a pair of opposed, parallel, dielectric, multilayer film mirrors, and a movable mirror between the dielectric multilayer film mirrors. The movable mirror is inclined so that oblique, incident light, projected into the space between the two dielectric multilayer film mirrors, is reflected between them a plurality of times and then is reflected by the movable mirror into a direction parallel to the dielectric multilayer film mirror surfaces and in an incidence plane defined by the incident light and a plane-normal to each dielectric multilayer film mirror and toward the incident light. Moving the movable mirror forwards and backwards, parallel to the multilayer film mirrors changes the amount of a chirp--.

The claims filed should be amended as follows:

Claim 3, page 5 line 13, the term "give" should be --given--.

The following changes to the drawings have been approved by the examiner and agreed upon by applicant: Figure 5 should be labeled as Prior Art. In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

With regard to Claim 1, though the prior art discloses a pair of dielectric multilayer film mirrors arranged so that their mirror surfaces extend parallel, and are opposed, to each other, it fails to teach or disclose a pair of dielectric multilayer film mirrors and a movable mirror which is disposed in a space defined between the two dielectric multilayer film mirrors and which is inclined and movable, wherein said given inclination of the movable mirror is in an inclination such that an incident light that is incident obliquely from one end of the space defined between the two dielectric multilayer film mirrors and is then allowed to reflect on and between them a plurality of times and is reflected by the movable mirror into a direction parallel to said dielectric multilayer film mirror surfaces in an incidence planed defined by said incident light and a

plane-normal of said dielectric multilayer film mirror and towards said one end, and said given movable direction is a direction that is parallel to said dielectric multilayer film mirror surfaces and extends in said incidence plane, whereby moving said movable mirror forwards and backwards in said movable direction changes the amount of a chirp to be imparted to said incident light as an input light.

With regard to Claim 2, though the prior art discloses a pair of dielectric multilayer film mirrors arranged so that the mirror surfaces extend parallel, and are opposed, to each other, it fails to teach or disclose a pair of dielectric multilayer film mirrors and a first and a second movable mirror which are disposed in a space defined between the two dielectric multilayer film mirrors and each of which is inclined at a given inclination and movable in a given movable direction, wherein said given inclination of the first movable mirror is an inclination such that an incident light that is incident parallel to said dielectric multilayer film mirror surfaces from one end of the space defined between said multilayer film mirrors is reflected by the first movable mirror so as to reflect on and between said mirror surfaces a plurality of times in an incidence plane defined by said incident light and a plane-normal of said dielectric multilayer mirror, said given inclination of the second movable mirror is an inclination such that said incident light having reflected a plurality of times as aforesaid is reflected by the second movable mirror into a direction parallel to said dielectric multilayer film mirror surfaces in said incidence plane and towards the other end of said space, said given movable direction is a direction that is parallel to said dielectric multilayer film mirror surfaces and extends in said incidence plane, whereby moving said first or second movable mirror forwards or

backwards in said movable direction to change the distance between them changes the amount of a chirp to be imparted to said incident light as an input light.

With regard to Claim 3, though the prior art discloses a pair of dielectric multilayer film mirrors arranged so that the mirror surfaces extend parallel, and are opposed, to each other, it fails to teach or disclose a pair of dielectric multilayer film mirrors; a fixed mirror disposed in a space defined between the two dielectric multilayer film mirrors at a center of the space, the fixed mirror having a first and a second reflecting surface each of which is inclined at a given inclination; and a first and a second movable mirror which are disposed a opposite sides of the fixed mirror, respectively, and each of which is movable in a given movable direction, wherein said given inclination of the first reflecting surface of said fixed mirror is an inclination such that an incident light that is incident parallel to said dielectric multilayer film mirror surfaces from one end of the space defined between said ~~tow~~ two ADM. dielectric multilayer film mirrors is reflected by said first reflecting surface so as to reflect on and between said dielectric multilayer film mirrors in an incidence plane defined by said incident light and a plane-normal of said dielectric multilayer mirror surface, said given inclination of the first movable mirror is an inclination such that the incident light having reflected a plurality of times as aforesaid is reflected by said first movable mirror into a direction that is parallel to said dielectric multilayer film mirror surfaces and extends in said incidence plane, a plurality of times towards said second movable mirror, said given inclination of the second movable mirror is an inclination such that the light having reflected from said first movable mirror is reflected by said second movable mirror so as

to reflect on and between said dielectric multilayer film mirrors a plurality of times in said incidence plane, said inclination of the second reflecting surface of said fixed mirror is an inclination such that the light from said second movable mirror, upon having reflected a plurality of times as aforesaid, is reflected by said second reflecting surface into a direction that is parallel to said dielectric multilayer film surfaces in said incidence plane and towards the other end of said space, and said given movable direction is a direction that is parallel to said dielectric multilayer film mirror surfaces and extends in said incidence plane, whereby moving said first or second movable mirror forwards or backwards in said movable direction to change the distance between them changes the amount of a chirp to be imparted to said incident light as an input light.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mitamura et al., United States Patent Application Publication No US 2003/0021527 A1 discloses two mirrors(see items 11 and 14 in Figure 1) that are dielectric multilayer films and a fixed mirror (see item 9 in Figure 1). This reference

does not provide the same configuration of the elements as the application by Matsuda et al.

Duguay et al., United States Patent No 3,675,154 discloses two mirrors (see items 12 and 14 in Figure 1) wherein light is reflected between them. This reference lacks the disclosure of a third and further lacks the disclosure of a fourth mirror between the first and second mirrors to vary the a chirp imparted to an incident light beam.

Fein et al., United States Patent No 3,498,693 discloses two reflectors (see items 70 and 71 in Figure 8 and a structure between them. This reference lacks a discussion of the third structure being movable to adjust a chirp.

United States Patent Application Publication US 2005/0100274 A1 discloses tow surfaces (see items 901 and 902 in Figure 10A) wherein a corner cube reflector (see item 911) is between them. This reference lacks a discussion of the reflector being movable to adjust a chirp.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aline D. McNaull whose telephone number is 571-272-8043. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ADM.
ADM
8/21/2006

/Drew A. Dunn/

DREW A. DUNN
SUPERVISORY PATENT EXAMINER